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(j) to provide a system that can be added to existing refuse containers and modified to meet changing weekly needs such as alternating type of recycle pick up, and long term changing capacity needs.

(k) the wheeled containers will nest in each other and the recycle containers will nest in each other and the wheeled containers will also nest in the recycle containers and the lower size of recycle containers can partially nest in the upper size of recycle container, thus being able to form a single pile of any number of sizes of recycle containers with the wheeled containers reducing shipping costs and distributor shelf space even for small quantities.

(l) provide the ability to deposit recyclable materials without having to remove lid, lift door, or dismantle while still providing covering from rain and snow.

(m) provide low cost, easy to engage handles, that have a positive lock and are not subject to orientation of container placed on top of them, and have an ergonomic advantage of for lifting as well as all the advantages listed in the US 4,691,840 FERBRACHE patent.

(n) provide a container system that could also function as a yard cart or general use cart.

(o) to provide a design of recycle bin that can be blow moulded.

Still further objects and advantages will become apparent from a consideration of the ensuing description and drawings.

DRAWING FIGURES

Fig 1 shows an existing 32 gallon Rubbermaid refuse container with a recycle container secured on top of it and a two bin recycle container hitched to it.

Fig 2 shows the cross section of the preferred embodiment of the interface of the wheeled recycle bin and the upper recycle bin, secured by the Ferbrache style of handles

Fig 2A shows the cross section of the preferred embodiment of the interface of the upper recycle bin and the upper recycle bin lid, secured by the Ferbrache style of handles

Fig 3 shows the cross section of an existing 32 gallon Rubbermaid refuse container with the preferred embodiment a refuse container recycle bin on top of it to be used when a single recycle bin is to be transported to the road without carrying it.

Fig 4 shows the preferred embodiment of the hitch that would be used when connecting Ferbrache style of handles to existing refuse containers or recycle bin combinations.

Fig 5 shows an alternative embodiment of a telescope fit using a sufficiently long interface between the upper container and the lower container.

Fig 6 shows an alternative embodiment of a recycle bin that slides in a lower container using a groove

Fig 7 shows an alternative embodiment of securing the containers together using over center type of locking handles

Fig 8 shows an alternative embodiment of securing the containers together using handles with a moulded latch to form a rigid entity.

Fig 9 shows three existing 32 gallon Rubbermaid refuse containers hitched together in the rest position

Fig 10 shows three existing 32 gallon Rubbermaid refuse containers hitched together with the lead container in the rest position.

Fig 11 shows three existing 32 gallon Rubbermaid refuse containers hitched together in the tilted free standing position.

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DESCRIPTION - FIG 1- Preferred Embodiment

A preferred embodiment of the present invention of the tiltable modular recycle container system is illustrated hitched to an existing 32 gallon Rubbermaid refuse container with a single recycle bin secured on top of it. This system allows for a single trip to the curb regardless of how many recycle bins or refuse containers are required without any carrying. The wheeled recycle bin 1 is preferably blow moulded or may be injection moulded, from the appropriate plastic for the type of manufacturing process used. The wheels 8 are located on the pulling side providing stability in the vertical rest position and a means for rolling near the center of gravity while tilted or moving. Refuse container lid 9 rests on the refuse container recycle bin 3. The flanged opening 7 has the flange protruding outward and allows items to be placed in without having to lift the upper recycle bin 2. For indoor storage the upper recycle bin 2 would have no opening in order to control odors. The handles 4 are used to secure the wheeled recycle bin 1 to the upper recycle bin 2, upper recycle bin 2 to the upper recycle bin lid 5, and the refuse container 10 to the refuse container recycle bin 3. The handle 4 of the refuse container 10 is in the unsecured position and is hitched to the handle of the upper recycle bin 2 by the hitch 6.

FIG 2

Fig 2 shows the cross section of the preferred embodiment of the interface of the wheeled recycle bin 1 and the upper recycle bin 2, secured by the handle 4. Details of the handle can be found in US 4,691,840 FERBRACHE patent. The upper recycle bin 2 resting position is determined horizontally by alignment edge 15 and vertically by support face 14. The tooth projections 16 prevent the upper recycle bin 2 from separating from the wheeled recycle bin by extending into indent 11 and restricting the movement, in the vertical direction, of base of indent 12. The grip 21 of the handle 4 allows lifting and releasing by rotating about stud projection 18 which pivots in mounting boss 20 to overcome resistance fit between lobe projections 17 and receptacle base recesses 19.

FIG 2A

Fig 2A shows the cross section of the preferred embodiment of the interface of the upper recycle bin 2 and the upper recycle bin lid 5 secured by the handle 4. Details of the handle can be found in US 4,691,840 FERBRACHE patent. The upper recycle bin 2 resting position is determined horizontally by alignment edge 15 and vertically by support face 14. The tooth projections 16 prevent the upper recycle bin lid 5 from separating from the wheeled recycle bin by extending into lid indent 11A and restricting the movement, in the vertical direction, of lid base of indent 12A. The grip 21 of the handle 4 allows lifting and releasing by rotating about stud projection 18 which pivots in mounting boss 20 to overcome resistance fit between lobe projections 17 and receptacle base recesses 19.

FIG 3

Fig 3 shows the cross section of an existing 32 gallon Rubbermaid refuse container 10 with the preferred embodiment a refuse container recycle bin 3 on top of it to be used when a single recycle bin is to be transported to the road without carrying it. The refuse container recycle bin 3 is secured by the handle 4. Details of the handle can be found in US 4,691,840 FERBRACHE patent. The refuse container recycle bin 3 resting position is determined horizontally by indent flange 24 and vertically by indent resting face 25 and resting shoulder 26. The tooth projections 16 prevent the refuse container recycle bin 3 from separating from the refuse container 10 by extending into indent flange 24 and restricting movement in the vertical direction of indent locking face 23. The

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FIG 10

Fig 10 shows the three refuse containers 10 of FIG 9 with the lead container 10L in the rest position with the center container 10C and rear container 10R in the tilted position. Handle 4 of lead container 10L which is adjacent to the wheels 8 is supported by its own side at the handle tilted rest point 64 of the Center container 10C.

FIG 11

Fig 11 shows the three refuse containers 10 of FIG 9 with the lead container 10L in the tilted free standing position also with the center container 10C and rear container 10R in the tilted position. Handle 4 of lead container 10L which is adjacent to the wheels 8 is supported by its own side at the handle tilted rest point 64 of the center container 10C and the lower corner of the lead container 10L which is adjacent to the wheels 8 is supported by the container tilted free standing point 65.

Reference Numerals In Drawings

- 1 wheeled recycle bin
- 2 upper recycle bin
- 3 refuse container recycle bin
- 4 handles (existing prior art Ferbrache US 4,691,840)
- 5 upper recycle bin lid
- 6 hitch
- 7 flanged opening
- 8 wheels
- 9 refuse container lid (for Rubbermaid 32 gallon refuse container existing prior art)
- 10 refuse container (Rubbermaid 32 gallon refuse container existing prior art)
- 10L lead container (Rubbermaid 32 gal refuse container existing prior art)
- 10C center container (Rubbermaid 32 gal refuse container existing prior art)
- 10R rear container (Rubbermaid 32 gal refuse container existing prior art)
- 11 indent
- 11A lid indent
- 12 base of indent
- 12A lid base of indent
- 13 rest face
- 13A lid rest face
- 14 support face
- 15 alignment edge
- 16 tooth projection
- 17 lobe projection
- 18 stud projection
- 19 receptacle base recesses
- 20 mounting boss
- 21 grip (portion of Ferbrache style handle also used for hitch)
- 22 assembly apertures
- 23 indent locking face
- 24 indent flange
- 25 indent resting face
- 26 resting shoulder

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OPERATION FIG 1-11

The manner of operation of a handle 4 for securing containers on top of each other is similar to the present use for securing lids 9 to the Rubbenmaid 32 gallon refuse container 10 and is described in detail in the Ferbrache US 4,691,840 patent. In the secured position, the handle 4 is rotated about stud projection 18 in an upward and inward direction towards the center vertical axis of the wheeled recycle bin 1 until the tooth projection 16 is touching the indent 11. In the unsecured position the handle 4 is rotated about stud projection 18 in an outward and downward direction towards the center vertical axis of the wheeled recycle bin 1 until the handle rests on the container wall, or hangs freely.

The placement of the upper recycle bin 2 on the wheeled recycle bin 1 is different from refuse container lid 9 placement in that it may also be forced down while handles 4 are in the secured position. The sides of the upper recycle bin 2 must also be aligned with the sides of the wheeled recycle bin 1 and the grips 21 of handles must be parallel to the axis of the wheels 8 when hitching. The upper recycle bin 2 is lowered so that its lower portion nests inside the alignment edge 15 of the wheeled recycle bin 1 and the rest face 13 rests on the support face 14. The handles 4 that were initially in the secured position will have been displaced outwardly and then sprung back to the secured position by the elastic force of the stressed receptacle base recesses 19 on the lobe projections 17. Handles 4 that were initially in the unsecured position may now be moved to the secured position prior to tilting to form the rigid entity.

The placement of the upper recycle bin lid 5 on the upper recycle bin 2 is different from cylindrical refuse container lid 9 placement in that the sides of the upper recycle bin lid 5 must also be aligned with the sides of the upper recycle bin 2. The upper recycle bin lid 5 is lowered so that its lower portion nests inside the alignment edge 15 of the upper recycle bin 2 and the lid rest face 13A rests on the support face 14. Handles 4 that were initially in the unsecured position may now be moved to the secured position.

The placement of the refuse container recycle bin 3 on the refuse container 10 is the same as refuse container lid 9 placement. Handles 4 that were initially in the unsecured position may now be moved to the secured position prior to tilting.

The hitching of refuse containers 10 and tiltable modular recycle containers, and multiple combinations thereof, requires the same operation. The containers are easier to hitch when in the free standing vertical rest position but may also be hitched while one or both are tilted and when handles 4 are secured or not secured. The hitch 6 is placed preferably on the lower radius of the grip 21 so that the axial center of one of the clasps 37 is aligned with the axial center of the grip 21 and the outer clasp projection 38 and the inner clasp projection 35 rest on radius of the grip 21. The other clasp 37 is preferably located furthest from tooth projections 16. The clasp 37 and grip 21 are squeezed together, between fingers and palm, causing the flexible groove body 39 to straighten, increasing the distance between the inner clasp projection 35 and the outer clasp projection 38, until they pass the maximum outer diameter of the grip 21 after which clasp groove 39 will seat itself along the grip 21 as flexible groove body 39 returns to its natural unstressed shape. The clasp 37 is now free to rotate about the grip 21. The other unsecured clasp is similarly secured on the grip 21 of the container to be hitched. The unhitching of containers requires a force applied, preferably with the thumb, to release grip 32 in a direction tangential to the circumference of the grip 21 while supporting the handle 4 with fingers of hand or other hand.

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The tilting of independent containers is preferably achieved by placing one's foot in front of the base of the wheeled side of the container and pulling the container lid toward one's body with one hand holding the grip 21 of the handle 4 with the other hand. Hitched containers are tilted the same manner but preferably the rear container 10R is first tilted by placing one's foot in front of the wheeled side of it and pushing with foot while unsecuring handle 4 of the center container 10C adjacent to the wheels 8, and rolling the rear container 10R away from the center container 10C until the unsecured handle 4 is at handle tilted rest point 64. The center container 10C is tilted second, after tilting rear container 10R, in the same manner, and then the lead container 10L is tilted.

CONCLUSIONS, RAMIFICATIONS AND SCOPE

Accordingly, the reader will see that the tiltable modular recycle bin system of this invention fulfills a long felt need for a low cost container system to bring refuse and a number of recyclables to the curb in a single trip without carrying. The invention of forming a single rigid entity from adjoining independent units allows tilted transport while overcoming the lifting constraints and eliminating the cart. This coincides with new use for the Ferbrache style of handles as a means for securing containers to form a single rigid entity, single recycle bins on the top of refuse containers, and hitching tiltable containers at the top. This would also include such things as tiltable luggage or suit cases that are wheeled and general purpose utility carts for indoor and outdoor use.

Thus the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the examples given.

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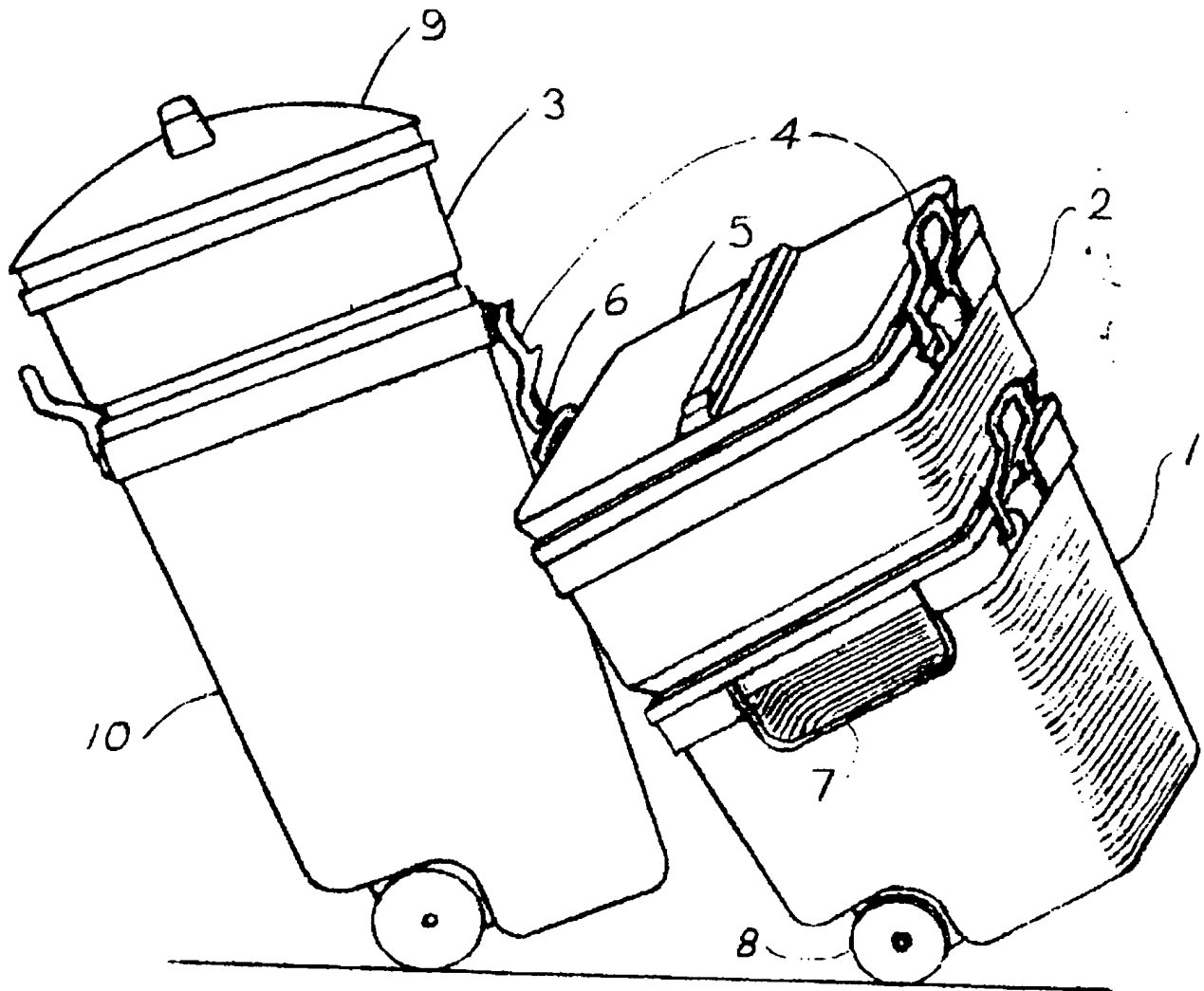


FIG 1

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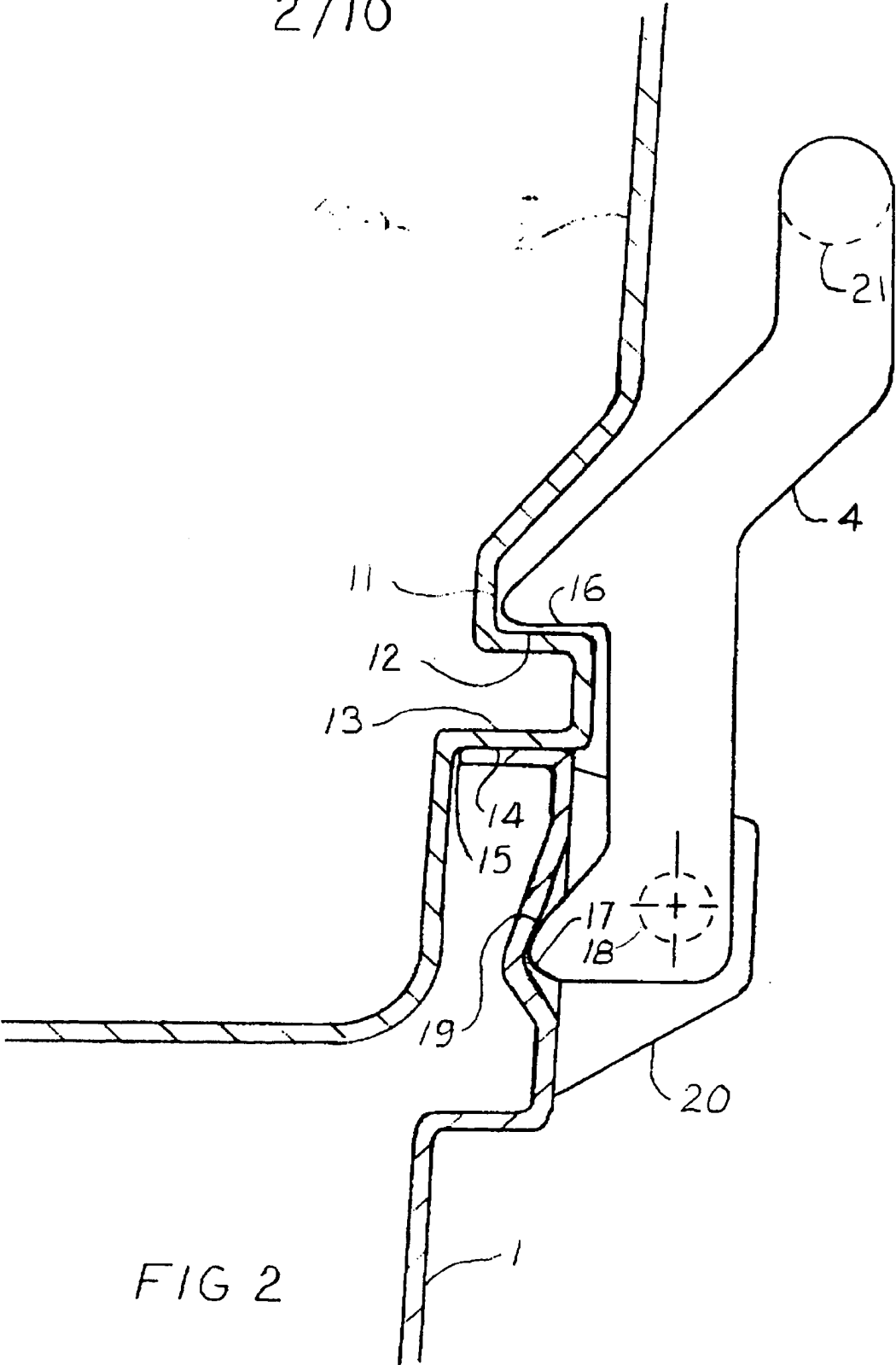
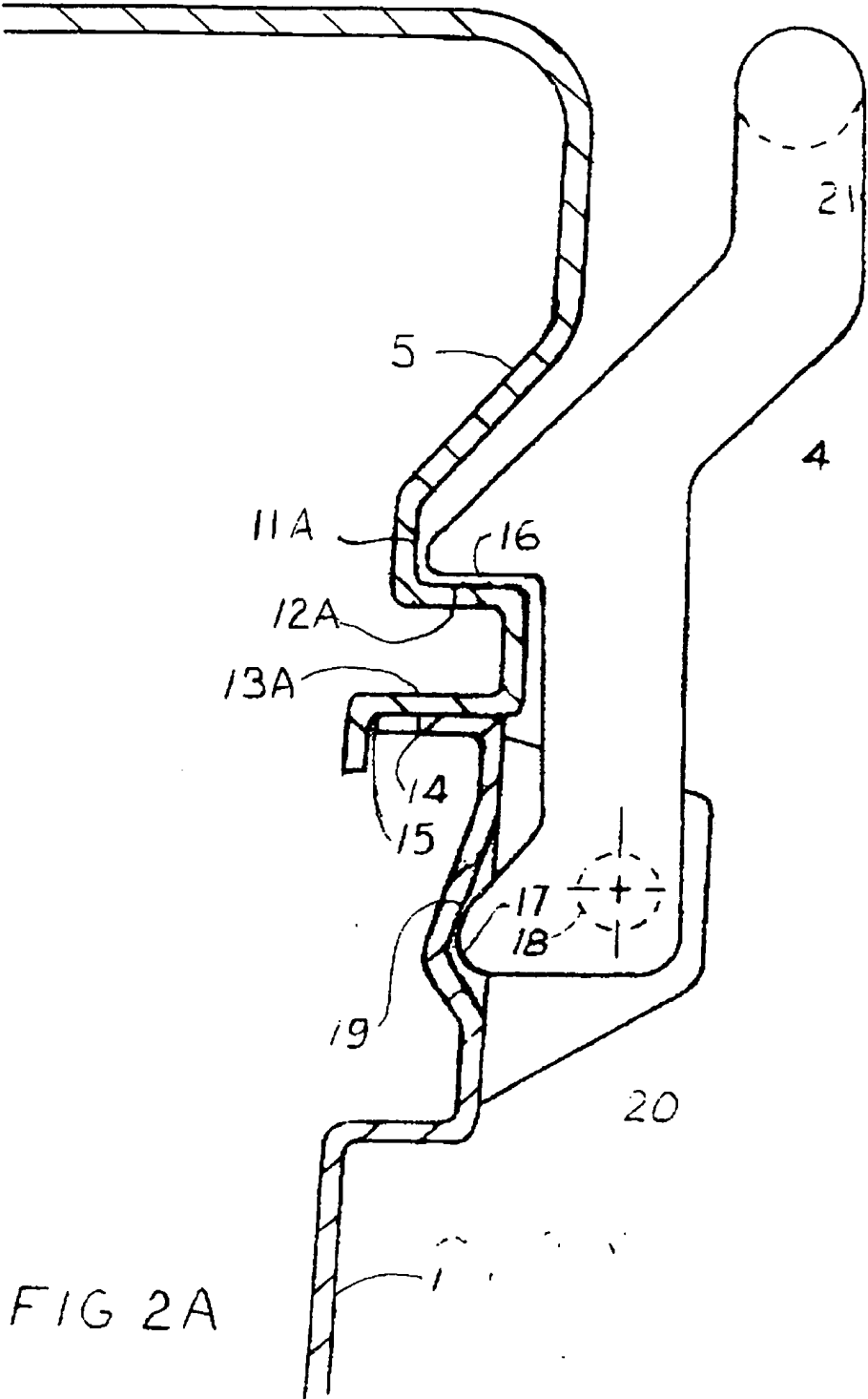


FIG 2

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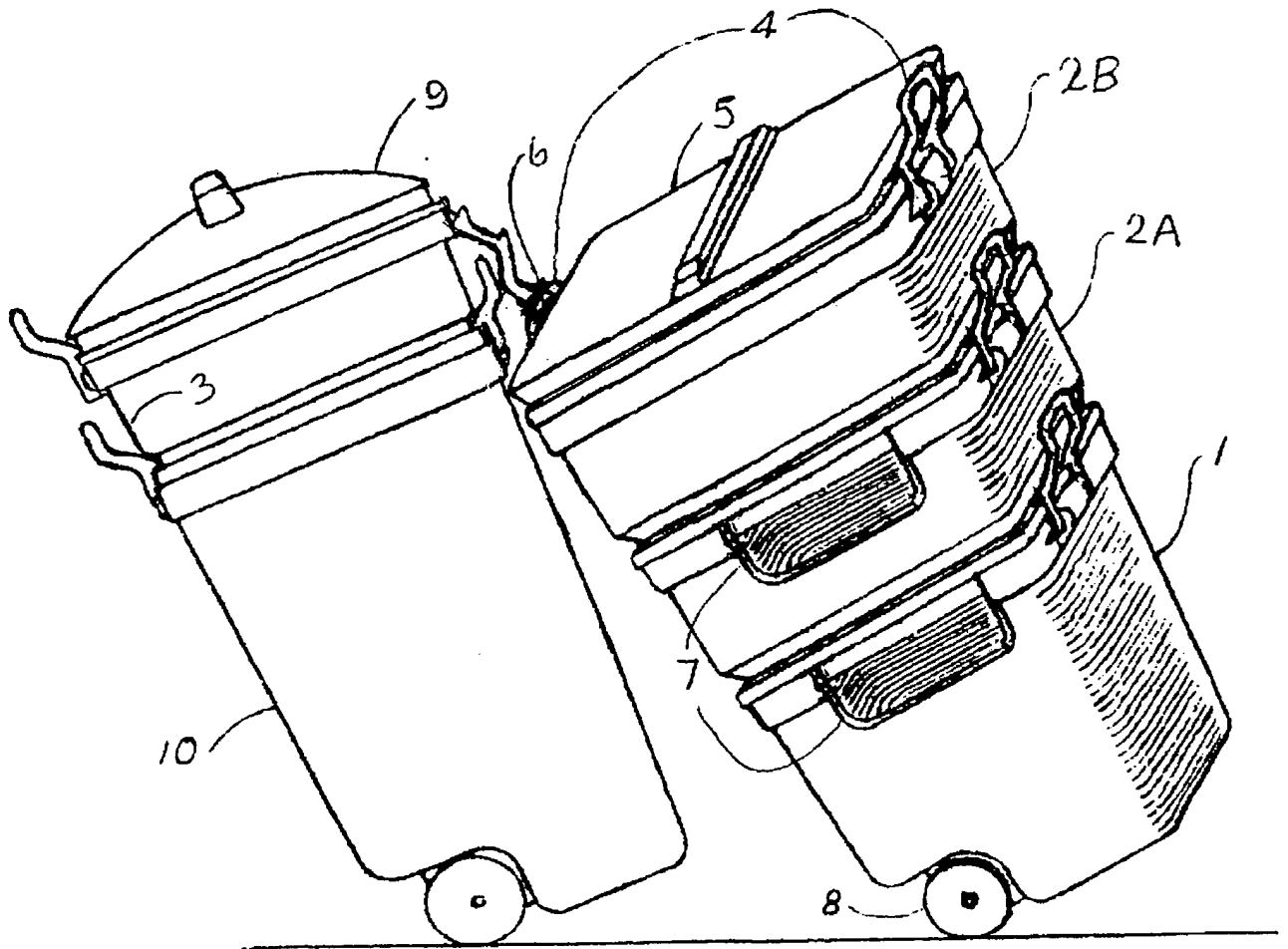


FIG 1

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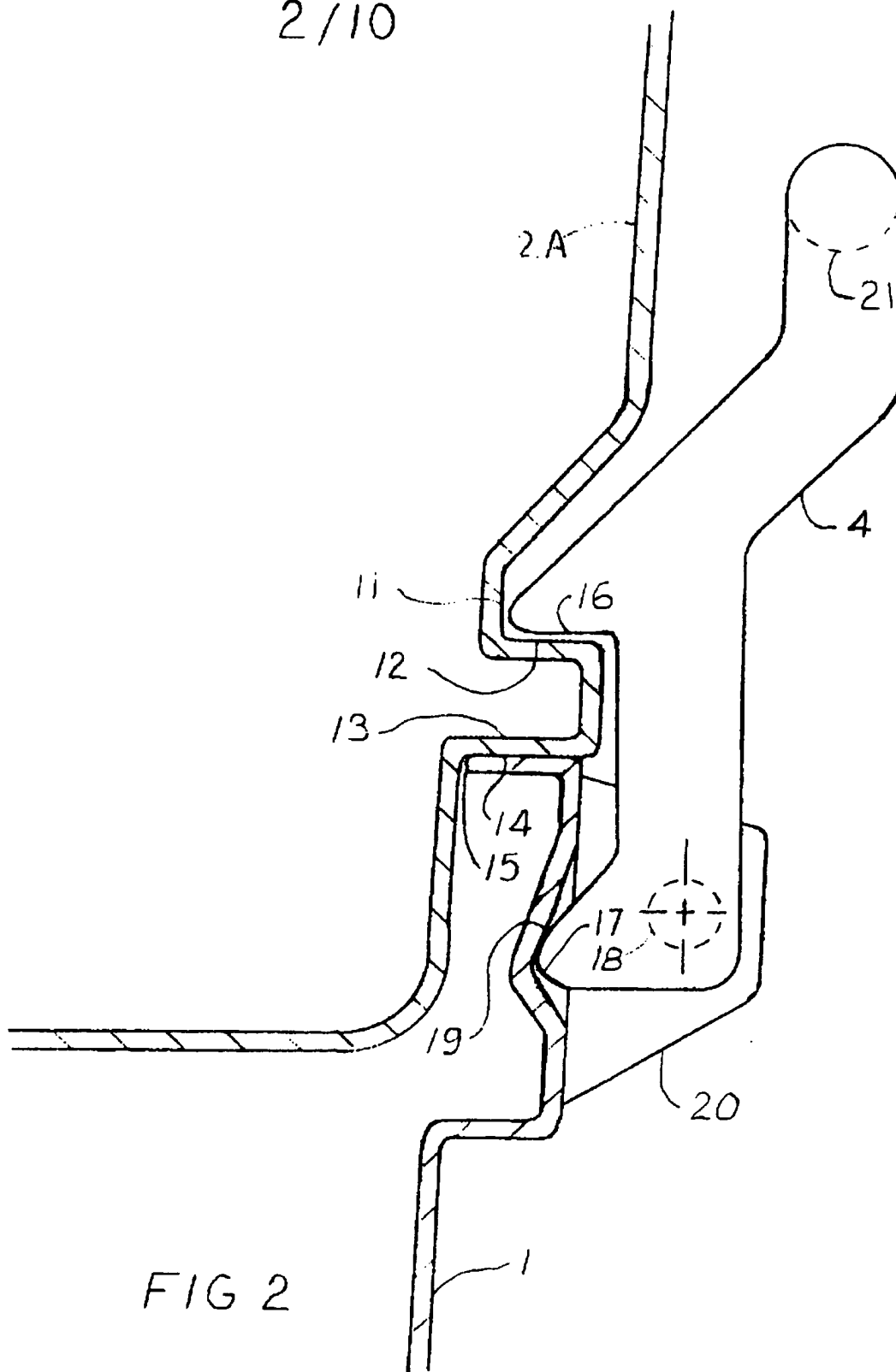


FIG 2

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